REMARKS

The foregoing amendments and these remarks are in response to the Office Action dated December 22, 2003. This amendment is timely filed.

At the time of the Office Action, claims 1-18 were rejected under 35 U.S.C. §103(a). Claim 8 was objected to as being dependent upon a rejected base claim, but the Examiner indicated that claim would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 1, 12, and 14 – 18 have now been amended for greater clarity. New claims 19 - 26 have likewise been added to recite alternative embodiments of the inventions.

Review of Applicant's Invention

Prior to addressing the Examiner's rejection on art, a brief review of Applicant's invention is appropriate. The invention concerns an improvement to broadband base stations that operate simultaneously on a plurality of transmit and receive carrier frequencies. In these types of broadband base stations, it is advantageous to provide a flat spectral response for all frequencies to be used. In other words, the base station response in both the transmit and receive directions should be relatively flat across the entire operational frequency spectrum that includes the various transmit and receive carrier frequencies. This flattening is accomplished in the present invention using software amplitude predistortion.

More specifically, a generic set of coefficients can be stored that are representative of amplitude distortions occurring as a result of signal conversions between analog and digital formats in said base station transceiver. At least one set of transceiver specific coefficients are also stored. The generic set of coefficients are

common to all A/D conversion devices and therefore do not need to be specific to a particular base station. However, the transceiver specific coefficients are representative of amplitude distortions associated with a specific broadband base station RF transceiver. Significantly, by using these two different types of data sets, an amplitude response of said specific broadband base station RF transceiver can be effectively equalized at a plurality of transmit and receive carrier frequencies within a selected one of the relatively narrow band segments.

According to one aspect of the invention, at least one set of the transceiver specific coefficients can be advantageously selected to include a first set of transceiver specific coefficients that are representative of amplitude distortions exclusive to narrowband processing within the specific broadband base station transceiver. Further, a second set of transceiver specific coefficients can be selected that are representative of amplitude distortions associated with wideband signal processing within said specific broadband base station transceiver. The software amplitude pre-distortion can use the first and second sets of transceiver specific coefficients concurrently to perform the software amplitude pre-distortion.

I. Claim Rejections on Art

Turning now to the Examiner's rejection, it is noted that Claims 1-7 and 9-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No. 6,275,685 to Wessel et al, ("Wessel") in view of U.S. Patent No. 5,161,044 to Nazarathy ("Nazarathy").

Wessel discloses a system for reducing amplitude and phase distortion in an RF amplifier. As explained at col. 5, lines 61-67 and col. 6, lines 1-5, amplifier distortion

can distort a power spectrum of a spread spectrum modulated signal. Wessel explains that this distortion is known to produce regrowth sidebands as illustrated in Fig. 1d. In order to overcome this problem, Wessel discloses that a pre-distortion circuit and a feedback circuit can be added to a high power amplifier. The feedback circuit produces an error signal, which is employed to modify a set of look up values. The pre-distortion circuit is an adaptive system that adjusts its gain and phase transfer functions in response to residual gain error and residual phase error signals. Actual gain and phase error correction signals are determined relative to a set of look-up values and a sample of the RF input signal to reduce complex distortion in the output signal. Notably, Wessel does not disclose flattening the output power among a plurality of transmit and receive carrier frequencies distributed within a passband of a wideband transceiver.

The Examiner concedes that Wessel fails to disclose flattening the output power among a plurality of transmit and receive carrier frequencies, but asserts that this deficiency is remedied by combining Wessel with Nazarathy. Applicant respectfully disagrees. Nazarathy does not disclose flattening the power among a plurality of transmit and receive carrier frequencies in a cellular base station. Instead, Nazarathy discloses a method for improving the linearity of integrated optical modulators. Nazarathy seeks to reduce second and third order harmonic distortion as signal power levels are varied relative to a quadrature operating point defined within the dynamic operating range of the device. In other words, Nazarathy is directed to using predistortion for achieving a linear dynamic response in one channel at a particular operating frequency as signal power levels are varied, not for achieving flattened or

equalized power levels as between a plurality of channels at different operating frequencies.

In Nazarathy, a pilot signal is injected and the harmonic distortion content of the optical output is monitored. A feedback bias signal is used to parametrically tune the operating points of the optical modulator and a predistortion network. More particularly, signals from the monitored optical output are fed back to the modulator driver and are used to parametrically tune non-linear pre-distortion circuits within the modulator driver in order to reduce second and third order intermodulation distortion.

Finally, Applicants respectfully traverse the Examiner's assertion that Nazarathy is an analogous art with respect to wideband cellular base stations. As noted above, Nazarathy concerns optical modulators and techniques by which their dynamic operation as a function of power level can be made more linear. One of ordinary skill in the art would not look to the field of optical modulators for the purpose of flattening power levels among a plurality of transmit and receive carrier frequencies in a wideband base station. Nazarathy does not concern wideband cellular base station transceivers, or the problem of reducing amplitude variations encountered in broadband transceiver systems among a set of channels in a multi-channel wideband RF transceiver.

From the foregoing, it is apparent that Nazarathy neither discloses nor suggests flattening the output power among a plurality of transmit and receive carrier frequencies distributed within a passband of a wideband transceiver. Accordingly, Applicant's respectfully request that he Examiner withdraw the rejection of claims 1-7 and 9-11 under 35 U.S.C. § 103(a).

Claims 12-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No. 6,223,056 to Appel, in view of Wessel and Nazarathy. However, the combination of Wessel and Nazarathy do not disclose that invention recited in claim 12. For example these references do not disclose that a digital processor can be provided in a broadband base station to discretely flatten the power in each of a plurality of transmit and receive carrier frequencies using software predistortion. So much is clear from Applicants' analysis of these references above in relation to claims 1-7 and 9-11.

The Examiner proposes to combine the Wessel and Nazarathy references with Appel for the purpose of rejecting claims 12-18 under 35 U.S.C. § 103(a). However, Appel fails to make up for the deficiencies of Wessel and Nazarathy. Appel does not disclose a digital processor in a broadband base station which can be used to flatten the power in each of a plurality of transmit and receive carrier frequencies using software predistortion. In fact, Appel does not disclose flattening of output power at all. Instead, Appel proposes a system for reducing the operating cost of a cellular system by controlling its overall power consumption. Appel accomplishes this result by adjusting the primary power to the base station in response to a monitored RF output power level. As such, Appel does not make up for the deficiencies in the Wessel and Nazarathy references as outlined above.

Applicants believe that all claims are in condition for allowance. However, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance.

Respectfully submitted,

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